NEW ENGLAND COMMON ASSESSMENT PROGRAM

**Released Items
Support Materials
2012**

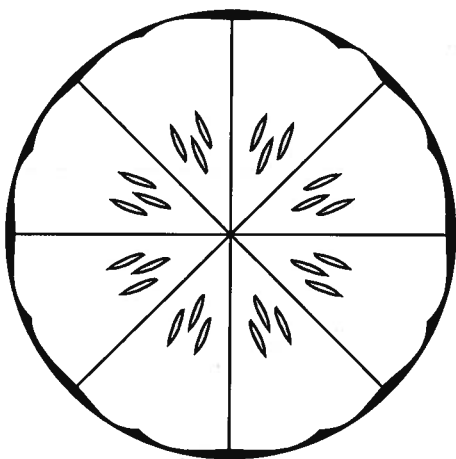**Grade 4
Mathematics**

N&O 3.1	Demonstrates conceptual understanding of rational numbers with respect to: whole numbers from 0 to 999 through equivalency, composition, decomposition, or place value using models, explanations, or other representations; and positive fractional numbers (benchmark fractions: $a/2$, $a/3$, $a/4$, $a/6$, or $a/8$, where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area and set models where the number of parts in the whole is equal to the denominator; and decimals (within a context of money) as a part of 100 using models, explanations, or other representations.

120033.001 120034 D Common, CMN

1 Look at this pie.

Juan took $\frac{2}{8}$ of the pie. Susie took $\frac{1}{8}$.

Lori took $\frac{1}{8}$. How much of the pie was

left over?

○ A. $\frac{1}{8}$

○ B. $\frac{2}{8}$

○ C. $\frac{3}{8}$

○ D. $\frac{4}{8}$

N&O 3.1　**Demonstrates conceptual understanding of rational numbers with respect to: whole numbers** <u>from 0 to 999</u> through equivalency, composition, decomposition, or place value **using models, explanations, or other representations**; and **positive fractional numbers** (benchmark fractions: $a/2$, $a/3$, $a/4$, <u>$a/6$</u>, or <u>$a/8$</u>, where a is a whole number greater than 0 and less than or equal to the denominator) as a part to whole relationship in area and set models where the number of parts in the whole is equal to the denominator; and **decimals <u>(within a context of money) as a part of 100</u> using models, explanations, or other representations.**

145538.001 A Common, CMN

2 What number has exactly 12 ones, 5 hundreds, and 20 tens?

○ A.　　712

○ B.　　802

○ C. 12,520

○ D. 52,012

N&O 3.2   **Demonstrates understanding of the relative magnitude of numbers** <u>from 0 to 999</u> by ordering whole numbers; by comparing whole numbers to benchmark whole numbers (100, <u>250</u>, <u>500</u>, <u>or 750</u>); or by <u>comparing whole numbers to each other</u>; and <u>comparing or identifying equivalent positive fractional numbers</u> ($a/2$, $a/3$, $a/4$ where a is a whole number greater than 0 and less than or equal to the denominator) using models, number lines, or explanations.

145802.002 180691 A Common, CMN

3 This table shows the number of library books at some schools.

School	Number of Library Books
King Elementary	480
Central Elementary	528
Johnson Elementary	465
Lincoln Elementary	551

Which school has the number of books **closest** to 500?

○ A. King Elementary

○ B. Central Elementary

○ C. Johnson Elementary

○ D. Lincoln Elementary

N&O 3.3 **Demonstrates conceptual understanding of mathematical operations** <u>by describing or illustrating the inverse relationship between addition and subtraction of whole numbers;</u> and <u>the relationship between repeated addition and multiplication using models, number lines, or explanations.</u>

120173.002 A Common, CMN

4 Molly solved this problem.

$$275$$
$$-119$$
$$\overline{156}$$

Which number sentence could Molly use to check her work?

- ○ A. $156 + 119 = \square$
- ○ B. $156 - 119 = \square$
- ○ C. $275 + 119 = \square$
- ○ D. $275 + 156 = \square$

N&O 3.3 **Demonstrates conceptual understanding of mathematical operations** <u>by describing or illustrating the inverse relationship between addition and subtraction of whole numbers</u>; and <u>the relationship between repeated addition and multiplication using models, number lines, or explanations.</u>

139437.003 C Common, CMN

5 Sandy is solving this problem.

$$5 \times 6 = \square$$

How could Sandy use counters to solve this problem?

○ A. Make 11 groups with 1 counter in each group.

○ B. Make 30 groups with 5 counters in each group.

○ C. Make 5 groups with 6 counters in each group.

○ D. Make 6 groups with 30 counters in each group.

> **N&O 3.4** **Accurately solves problems involving** addition and subtraction with and without regrouping; the concept of multiplication; and addition or subtraction of decimals (in the context of money).

120187.001 A Common, CMN

6 Amy bought 3 packages of buttons. Each package had 8 buttons. She used 19 buttons to make puppets. How many buttons does Amy have left?

○ A. 5

○ B. 8

○ C. 15

○ D. 43

G&M 3.1 <u>Uses properties or attributes of angles</u> (number of angles) <u>or sides</u> (number of sides or length of sides) or composition or decomposition of shapes <u>to identify, describe, or distinguish among</u> <u>triangles, squares, rectangles, rhombi, trapezoids, hexagons, or circles.</u>

120108.003 120109 A Common, CMN

7 Kim cut this square into two triangles as shown below.
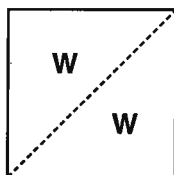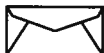
She tried to make these shapes with the two triangles.
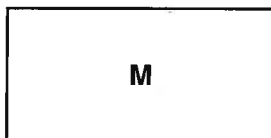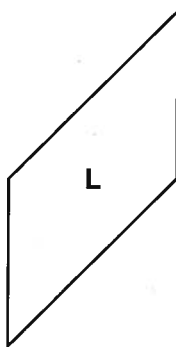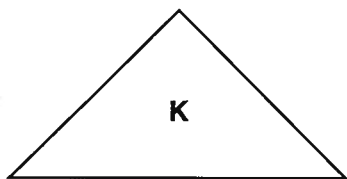
Which shapes can Kim make?

○ A. K and L only

○ B. L and M only

○ C. K and M only

○ D. K, L, and M

F&A 3.4 **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions using models or different representations of the expressions; or by finding the value that will make an open sentence true (e.g., $2 + \square = 7$). (limited to one operation and limited to use addition, subtraction, or <u>multiplication</u>)

201358.002 201359 B Common, CMN

8 Look at this number sentence.

$$4 \times 4 \times \boxed{?} = 8 \times 2$$

What number makes this number sentence true?

- ○ A. 0
- ○ B. 1
- ○ C. 2
- ○ D. 16

> **DSP 3.1**   **Interprets a given representation** (line plots, tally charts, tables, or <u>bar graphs</u>) to answer
> questions related to the data, to analyze the data to formulate conclusions, or to <u>make predictions</u>.
> (IMPORTANT: *Analyzes data consistent with concepts and skills in DSP 3.2.*)

144648.002 144649 C Common, CMN

9 This bar graph shows the average speeds three different types of whales can swim.

**Average Speeds
Whales Swim**
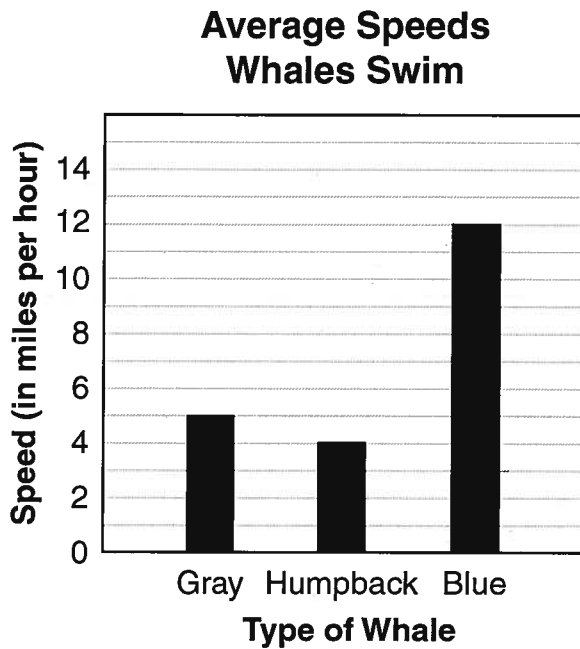
How much faster does a blue whale swim than a gray whale swims?

- ○ A. 5 miles per hour
- ○ B. 6 miles per hour
- ○ C. 7 miles per hour
- ○ D. 8 miles per hour

DSP 3.3	Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in DSP 3.1.

169097.002 169098 B Common, CMN

10 Ms. Lang asked the students in her class, "What color is your backpack?" This tally chart shows the students' answers.

Backpack Colors

Color	Number of Students
Blue	|||
Purple	||
Red	⟋⟋⟋⟋⟋
Green	||
Pink		
Black	⟋⟋⟋⟋⟋

Ms. Lang wants to use the information in the tally chart to make a bar graph. How many bars will be on the bar graph?

○ A. 2

○ B. 6

○ C. 7

○ D. 18

N&O 3.3 **Demonstrates conceptual understanding of mathematical operations** <u>by describing or illustrating the inverse relationship between addition and subtraction of whole numbers</u>; and <u>the relationship between repeated addition and multiplication using models, number lines, or explanations</u>.

120159.002 Common, CMN

⑪ Look at this number sentence.

$$6 + 6 + 6 = \square$$

Write a multiplication sentence that means the same as this number sentence.

Scoring Guide:

Score	Description
1	for a correct multiplication sentence
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

SCORE POINT 1
(EXAMPLE A)

120159.002 Common, CMN

11 Look at this number sentence.

$$6 + 6 + 6 = \boxed{18}$$

Write a multiplication sentence that means the same as this number sentence.

$$3 \times 6 = 18$$

> The student's response is correct.

SCORE POINT 1
(EXAMPLE B)

120159.002 Common, CMN

11 Look at this number sentence.

$$6 + 6 + 6 = \square$$

Write a multiplication sentence that means the same as this number sentence.

$$6 \times 3 = 18$$

> The student's response is correct.

120159.002 Common, CMN

11 Look at this number sentence.

$6 + 6 + 6 = \square$

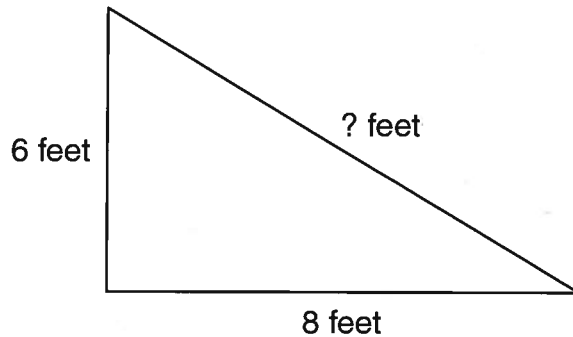Write a multiplication sentence that means the same as this number sentence.

$6 + 6 + 6 = 18$

| The student's response is incorrect. |

G&M 3.6 **Demonstrates conceptual understanding of perimeter of** polygons, and **the area of** rectangles
on grids using a variety of models or manipulatives. Expresses all measures using appropriate units.

124737.001 124738 Common, CMN

⑫ Look at this triangle.

6 feet

? feet

8 feet

The perimeter of the triangle is 24 feet. What is the length of the third side?

_____ feet

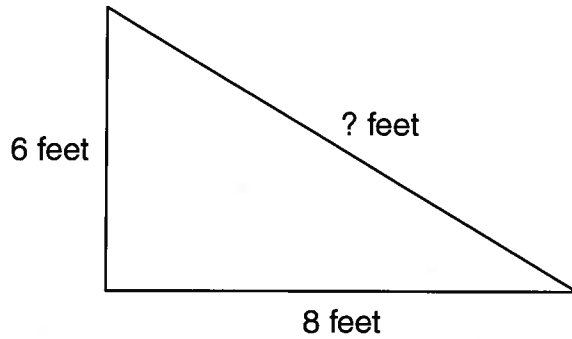## Scoring Guide:

Score	Description
1	for correct answer, **10**
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

124737.001 124738 Common, CMN

⑫ Look at this triangle.

6 feet

? feet

8 feet

The perimeter of the triangle is 24 feet. What is the length of the third side?

10 feet

The student's response is correct.

124737.001 124738 Common, CMN

⑫ Look at this triangle.

6 feet

? feet

8 feet

The perimeter of the triangle is 24 feet. What is the length of the third side?

6 + 8 = 14

$$\begin{array}{r} 24 \\ -14 \\ \hline 10 \end{array}$$ ✓ anwser

_10_ feet
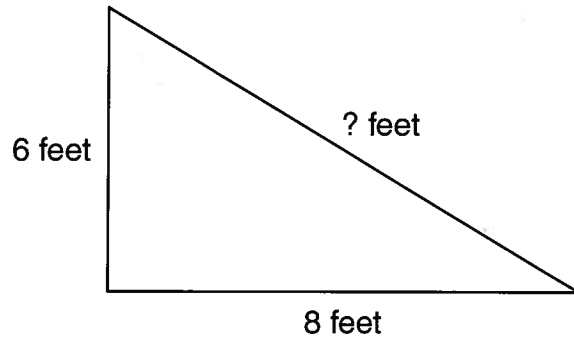
| The student's response is correct. (Showing work is not required.) |

124737.001 124738 Common, CMN

12 Look at this triangle.

6 feet

? feet

8 feet

The perimeter of the triangle is 24 feet. What is the length of the third side?

_____ feet

The student's response is incorrect.

F&A 3.4 **Demonstrates conceptual understanding of equality** by showing equivalence between two expressions using models or different representations of the expressions; or by finding the value that will make an open sentence true (e.g., $2 + \square = 7$). (limited to one operation and limited to use addition, subtraction, or <u>multiplication</u>)

120199.001 120200 Common, CMN

⑬ Look at this number sentence.

$$\triangle = 10 - \triangle$$

Each triangle has the same value. What is the value of each triangle?

Scoring Guide:

Score	Description
1	for correct answer, **5**
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

SCORE POINT 1
(EXAMPLE A)

120199.001 120200 Common, CMN

⓭ Look at this number sentence.

$$\triangle_5 = 10 - \triangle_5$$

The student's response is correct.

Each triangle has the same value. What is the value of each triangle?

SCORE POINT 1
(EXAMPLE B)

120199.001 120200 Common, CMN

⓭ Look at this number sentence.

$$\triangle = 10 - \triangle$$

Each triangle has the same value. What is the value of each triangle?

5

The student's response is correct.

SCORE POINT 0
(EXAMPLE A)

120199.001 120200 Common, CMN

13 Look at this number sentence.

$$\triangle_{10} = 10 - \triangle_{20}$$

The student's response is incorrect.

Each triangle has the same value. What is the value of each triangle?

120199.001 120200 Common, CMN

⑬ Look at this number sentence.

$$\triangle 1 = 10 - \triangle 3$$

The student's response is incorrect.

Each triangle has the same value. What is the value of each triangle?

The value of each triangle is three because a triangle has three sides. Since the value of each triangle is three you do ten minus three equals seven.

N&O 3.2 **Demonstrates understanding of the relative magnitude of numbers** <u>from 0 to 999</u> by ordering whole numbers; by comparing whole numbers to benchmark whole numbers (100, <u>250</u>, <u>500</u>, <u>or 750</u>); or by <u>comparing whole numbers to each other</u>; and <u>comparing or identifying equivalent positive fractional numbers</u> (*a*/2, *a*/3, *a*/4 where *a* is a whole number greater than 0 and less than or equal to the denominator) using models, number lines, or explanations.

120222.002 120223 Common, CMN

⑭ Look at this number line.
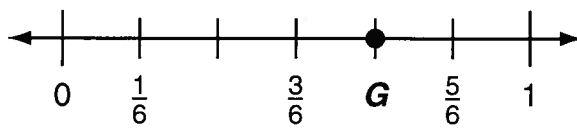
a. What fraction does point *G* represent on the number line?

b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

Scoring Guide:

Score	Description
2	for correct answer in part a, $\frac{4}{6}$ (or equivalent), and in part b
1	for correct answer in part a only OR for correct answer in part b only OR for correct answer in part b based on an incorrect answer in part a
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

SCORE POINT 2
(EXAMPLE A)

120222.002 120223 Common, CMN
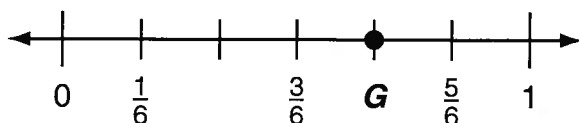
14 Look at this number line.

a. What fraction does point *G* represent on the number line?

4/6

> Part a: The student's response is correct.

b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

2/3

> Part b: The student's response is correct.

SCORE POINT 2
(EXAMPLE B)

120222.002 120223 Common, CMN

14 Look at this number line.

a. What fraction does point *G* represent on the number line?

$\frac{4}{6}$

> Part a: The student's response is correct.

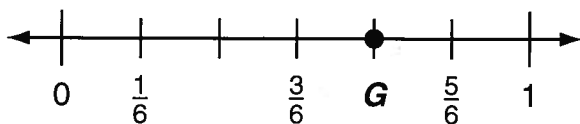b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

$\frac{8}{12}$

> Part b: The student's response is correct.

SCORE POINT 1
(EXAMPLE A)

120222.002 120223 Common, CMN

14 Look at this number line.

a. What fraction does point G represent on the number line?

$$\frac{4}{6}$$

> Part a: The student's response is correct.

b. Write a different fraction that is equivalent to the fraction you wrote in part (a).
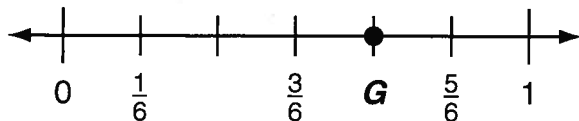
$$\frac{3}{7}$$

> Part b: The student's response is incorrect.

SCORE POINT 1
(EXAMPLE B)

120222.002 120223 Common, CMN

14 Look at this number line.

a. What fraction does point G represent on the number line?

$$\frac{1}{2}$$

> Part a: The student's response is incorrect.

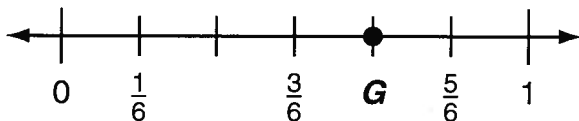b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

$$\frac{2}{4}$$

> Part b: The student's response is correct based on an incorrect answer in part a.

120222.002 120223 Common, CMN

14 Look at this number line.

$$0 \quad \frac{1}{6} \quad \frac{3}{6} \quad G \quad \frac{5}{6} \quad 1$$

a. What fraction does point G represent on the number line?

$\frac{6}{4}$

Part a: The student's response is incorrect.

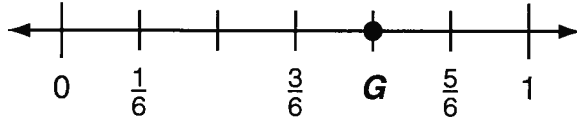b. Write a different fraction that is equivalent to the fraction you wrote in part (a).

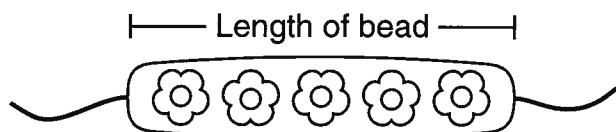$\frac{7}{5}$

Part b: The student's response is incorrect.

G&M 3.7	Measures and uses units of measures appropriately and consistently, and makes conversions within systems when solving problems across the content strands.

139487.004 139488 Common, CMN
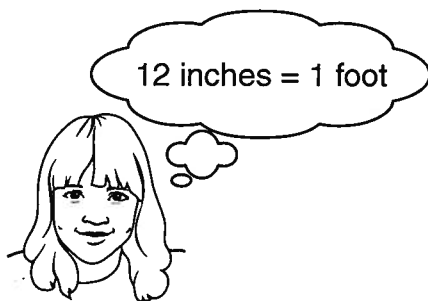
⑮ Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.

⊢—— Length of bead ——⊣

a. What is the length of this bead to the nearest inch?

_____ inches

Monique wants to put 1 foot 6 inches of her beads on a string.

12 inches = 1 foot

b. What is the total number of beads Monique needs?

Scoring Guide:

Score	Description
2	for correct answer in part a, **2**, and in part b, **9**
1	for correct answer in part a only OR for correct answer in part b only OR for correct answer in part b based on an incorrect answer in part a
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

139487.004 139488 Common, CMN

⑮ Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.

├── Length of bead ──┤

a. What is the length of this bead to the nearest inch?

2 inches

Part a: The student's response is correct.

Monique wants to put 1 foot 6 inches of her beads on a string.

12 inches = 1 foot

b. What is the total number of beads Monique needs?

9

Part b: The student's response is correct.

139487.004 139488 Common, CMN

⑮ Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.

├── Length of bead ──┤

a. What is the length of this bead to the nearest inch?

_____ **2** inches

| Part a: The student's response is correct. |

Monique wants to put 1 foot 6 inches of her beads on a string.

12 inches = 1 foot

b. What is the total number of beads Monique needs?

The total number of beads Monique needs
is 9.

$+\frac{2}{2}$
$\frac{4}{+\frac{2}{6}}$
$+\frac{2}{4}$
$+\frac{2}{10}$
$+\frac{2}{12}$

$+\frac{2}{2}$
$+\frac{2}{4}$
$\frac{2}{6}$

6 beads in one foot   3×2=6

6×2=12   3 beads in 6 inches.

3+6=9
9 beads in 1 foot
and 6 inches.

| Part b: The student's response is correct. |
| (Showing work is not required.) |

SCORE POINT 1

139487.004 139488 Common, CMN

15 Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.
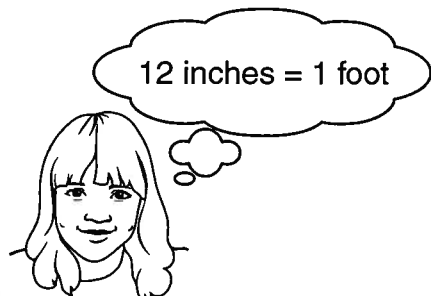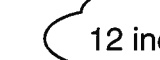
├──── Length of bead ────┤
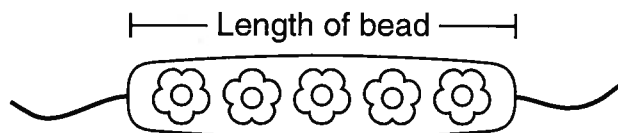
a. What is the length of this bead to the nearest inch?

_____2_____ inches

| Part a: The student's response is correct. |

Monique wants to put 1 foot 6 inches of her beads on a string.

12 inches = 1 foot

b. What is the total number of beads Monique needs?

12 inches + 6 inches = 18 inches

18 inches

| Part b: The student's response is incorrect. |

SCORE POINT 0

139487.004 139488 Common, CMN

15 Use your ruler to answer this question.

Monique has a set of beads. Each of her beads is the same length as this bead.
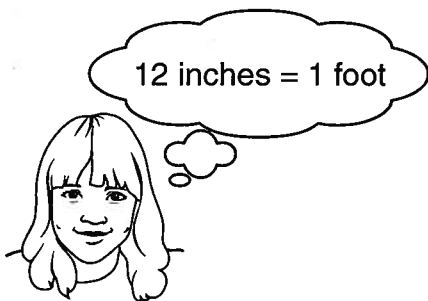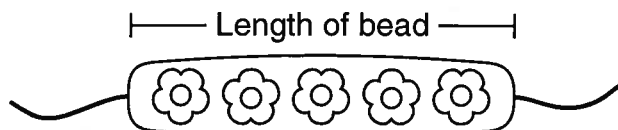
⊢—— Length of bead ——⊣

a. What is the length of this bead to the nearest inch?

$8\frac{1}{2}$

_____ inches

> Part a: The student's response is incorrect.

Monique wants to put 1 foot 6 inches of her beads on a string.

12 inches = 1 foot
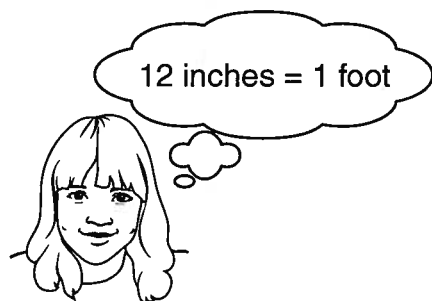
b. What is the total number of beads Monique needs?

She needs 7 more beads.

> Part b: The student's response is incorrect.

DSP 3.2	Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using most frequent (mode), least frequent, largest, or smallest.

139527.004 139528 Common, CMN

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.

- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	
Tanya	
Walter	
Ava	

Scoring Guide:

Score	Description
2	Student correctly completes table, **blue, blue, red, red,** in any order.
1	Student completes table to meet only one condition.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

139527.004 139528 Common, CMN

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.

- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	*blue*
Tanya	*Red*
Walter	*Red*
Ava	*blue*

The student's response is correct.

SCORE POINT 1
(EXAMPLE A)

139527.004 139528 Common, CMN

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.

- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	blue
Tanya	blue
Walter	blue
Ava	blue

The student's response meets one condition.

SCORE POINT 1
(EXAMPLE B)

139527.004 139528 Common, CMN

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.

- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	*Blue*
Tanya	*Red*
Walter	*Red*
Ava	*Green*

The student's response meets one condition.

SCORE POINT 0

139527.004 139528 Common, CMN

16 Ms. Corrigan gave notebooks to nine students. Each notebook was either red, blue, or green.

- Red was the most common color.
- Green was less common than blue.

Complete this table to show what color notebooks Ms. Corrigan could have given to Bryce, Tanya, Walter, and Ava.

Notebooks

Student	Color
Kirk	Red
Stacey	Red
Yolanda	Green
Chuck	Green
Anthony	Blue
Bryce	*red*
Tanya	*red*
Walter	*green*
Ava	*green*

The student's response is incorrect.

Grade 4 Mathematics Released Item Information – 2012

Released Item Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No Tools Allowed		✓	✓	✓		✓										
Content Strand[1]	NO	NO	NO	NO	NO	NO	GM	FA	DP	DP	NO	GM	FA	NO	GM	DP
GLE Code	3-1	3-1	3-2	3-3	3-3	3-4	3-1	3-4	3-1	3-3	3-3	3-6	3-4	3-2	3-7	3-2
Depth of Knowledge Code	2	2	1	1	2	2	2	2	2	2	2	2	2	2	2	3
Item Type[2]	MC	MC	MC	MC	MC	MC	MC	MC	MC	MC	SA	SA	SA	SA	SA	SA
Answer Key	D	A	A	A	C	A	A	B	C	B						
Total Possible Points	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2

[1]Content Strand: NO = Numbers & Operations, GM = Geometry & Measurement, FA = Functions & Algebra, DP = Data, Statistics, & Probability

[2]Item Type: MC = Multiple Choice, SA = Short Answer